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Exelon SM
Nuclear

10 CFR 50.59
10 CFR 50.90

RS-02-171

October 1, 2002

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Quad Cities Nuclear Power Station, Units 1 and 2
Facility Operating License Nos. DPR-29 and DPR-30
NRC Docket Nos. 50-254 and 50-265

Subject: Request for License Amendment Related to Heavy Loads Handling

References: (1) Letter from J. S. Abel (Commonwealth Edison Company) to U. S. NRC, "Dresden Station Units 2 and 3, Quad Cities Station Units 1 and 2, Dresden Special Report No. 41, Quad Cities Special Report No. 16, 'Reactor Building Crane and Cask Yoke Assembly Modifications,' AEC Dckt. 50-237, 50-249, 50-254 and 50-265," dated November 8, 1974

(2) Letter from J. S. Abel (Commonwealth Edison Company) to U. S. NRC, "Dresden Station Units 2 and 3, Quad Cities Station Units 1 and 2, Dresden Special Report No. 41, Supplement A, Quad Cities Special Report No. 16 – Supplement A, 'Reactor Building Crane and Cask Yoke Assembly Modifications,' NRC Dckts. 50-237, 50-249, 50-254 and 50-265," dated June 3, 1975

In accordance with 10 CFR 50.90, "Application for amendment of license or construction permit," and 10 CFR 50.59, "Changes, tests, and experiments," Exelon Generation Company (Exelon), LLC, is requesting changes to Facility Operating License Nos. DPR-29 and DPR-30, for Quad Cities Nuclear Power Station (QCNPS), Units 1 and 2. The proposed changes will allow Exelon to use the QCNPS Unit 1/2 reactor building crane to lift heavy loads in excess of 110 tons over an operating unit. Specifically, Exelon is requesting approval to revise the QCNPS Updated Final Safety Analysis Report (UFSAR) to use the reactor building crane for heavy loads up to a total of 125 tons for removal and re-installation activities for six reactor cavity shield blocks during the upcoming Unit 1 refueling outage, Q1R17. Reactor cavity shield block removal activities are scheduled to commence on November 5, 2002.

In 1974, Commonwealth Edison (ComEd) Company, now Exelon, extensively modified the Dresden Nuclear Power Station (DNPS) and QCNPS reactor building cranes with the intent of qualifying the cranes as single failure-proof for their full rated capacity of 125 tons. In support of a Technical Specifications amendment request to support spent fuel cask handling, we provided information regarding these modifications in References 1 and 2. In this information we stated that the fuel casks used would weigh up to 100 tons and would be handled with a 10 ton lifting rig.

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In a teleconference with the NRC on September 13, 2002, the NRC stated that it considers the DNPS reactor building crane approved as meeting single failure-proof criteria only for loads of up to 110 tons. Since the DNPS and QCNPS reactor building cranes have similar designs and licensing bases, it is concluded that the QCNPS crane is also approved as meeting single failure-proof criteria for loads of 110 tons. At QCNPS, the reactor cavity shield blocks, which are moved to the operating unit during the refueling outage, are likely to exceed 110 tons, based on the results of the DNPS weight determination recently performed (approximately 115 tons and 113 tons for each half of the top layer). Therefore, the proposed use of the QCNPS crane for the activities described above without supporting analyses could have the potential to create a new accident not analyzed in the UFSAR. This would require NRC approval in accordance with 10 CFR 50.59, "Changes, tests, and experiments." However, as stated in Attachment C, the proposed changes involve no significant hazards consideration.

In order to provide a long-term resolution for this issue, Exelon will complete additional analyses and submit a license amendment request related to heavy loads handling to support future refueling outages. In the interim, Exelon is requesting a one-time license amendment to allow use of the QCNPS Unit 1/2 reactor building crane for lifting a total load of up to 125 tons. This will allow QCNPS to perform required activities, such as reactor disassembly, for refueling outage Q1R17. The reactor cavity shield blocks are placed on the refuel floor of the operating unit (i.e., Unit 2). All laydown areas have been optimized to support outage critical path activities and minimize crane moves. This optimization results in improved personnel safety and lower personnel radiation exposures due to less restrictive work areas.

Exelon is requesting approval of this amendment by November 4, 2002, on an exigent basis in accordance with 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (a)(6). This request meets the criteria of 10 CFR 50.91 (a)(6) because time does not permit the NRC to publish a Federal Register notice allowing 30 days for prior public comment and the requested amendment involves no significant hazards consideration. In accordance with 10 CFR 50.91 (a)(6)(vi), the exigency could not be avoided by Exelon for the following reasons.

- As noted above, on September 13, 2002, the NRC informed Exelon that the DNPS crane was approved as meeting single failure-proof criteria for loads of up to 110 tons. In response, DNPS considered options to allow the DNPS crane to be used for reactor disassembly for the Unit 3 refueling outage heavy loads activities. These options included determining the weight of the reactor shield blocks.
- On September 20, 2002, DNPS determined that the weight of the reactor cavity shield blocks is greater than 110 tons.
- In a teleconference on September 25, 2002, between members of Exelon and members of the NRC, the NRC indicated that a license amendment would be required to allow DNPS to lift the reactor cavity shield blocks over an operating unit.
- In response, Exelon submitted a license amendment request for DNPS on September 26, 2002. This amendment request was submitted for DNPS only, due to the extremely limited time available prior to scheduled heavy loads activities at DNPS, which were scheduled to begin on October 6, 2002.

- Immediately following submittal of the license amendment request for DNPS, Exelon began reviewing options to allow the QCNPS reactor building crane to be used for reactor disassembly for the Unit 1 refueling outage heavy loads activities. This review considered the possibility of placing the reactor shield blocks on the refueling floor of the shutdown unit. On September 27, 2002, it was determined that a license amendment request would be required for QCNPS.
- The enclosed license amendment request has been submitted in a timely manner based on the developments described above. Exelon could not have avoided the exigency due to the rapidly developing nature of this situation and its applicability to both DNPS and QCNPS.

This request is subdivided as follows.

1. Attachment A gives a description and safety analysis of the proposed changes.

2. Attachment B provides the proposed revisions to the UFSAR.

3. Attachment C describes our evaluation performed using the criteria in 10 CFR 50.91(a), "Notice for public comment," paragraph (1), which provides information supporting a finding of no significant hazards consideration using the standards in 10 CFR 50.92, "Issuance of amendment," paragraph (c).

4. Attachment D provides information supporting an Environmental Assessment.

These proposed changes have been reviewed by the QCNPS Plant Operations Review Committee and approved by the Nuclear Safety Review Board in accordance with the requirements of the Exelon Quality Assurance Program.

Exelon is notifying the State of Illinois of this request for changes to the operating license by transmitting a copy of this letter and its attachments to the designated State Official.

Should you have any questions concerning his letter, please contact Mr. Allan R. Haeger at (630) 657-2807.

Respectfully,

Terrence D. Simpkin
for Keith R. Jury
Director - Licensing
Mid-West Regional Operating Group

Attachments: Affidavit
Attachment A Description and Safety Analysis for Proposed Changes
Attachment B Proposed Revisions to the UFSAR

Attachment C Information Supporting a Finding of No Significant Hazards Consideration
Attachment D Information Supporting an Environmental Assessment

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Quad Cities Nuclear Power Station
Office of Nuclear Facility Safety – Illinois Department of Nuclear Safety

STATE OF ILLINOIS	)	
COUNTY OF DUPAGE	)	
IN THE MATTER OF	)	
EXELON GENERATION COMPANY, LLC	)	**Docket Numbers**
QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2	)	**50-254 and 50-265**

SUBJECT: Request for License Amendment Related to Heavy Loads Handling

AFFIDAVIT

I affirm that the content of this transmittal is true and correct to the best of my knowledge, information, and belief.

Terrence W. Simpkin
Manager - Licensing
Mid-West Regional Operating Group

Subscribed and sworn to before me, a Notary Public in and for the State above named, this 1st day of October, 2002.

"OFFICIAL SEAL"
TIMOTHY A. BYAM
NOTARY PUBLIC STATE OF ILLINOIS
COMMISSION EXPIRES 12/04/05

Notary Public

Attachment A

DESCRIPTION AND SAFETY ANALYSIS FOR PROPOSED CHANGES

A. SUMMARY OF THE PROPOSED CHANGES

In accordance with 10 CFR 50.90, "Application for amendment of license or construction permit," and 10 CFR 50.59, "Changes, tests, and experiments," Exelon Generation Company (Exelon), LLC, is requesting changes to Facility Operating License Nos. DPR-29 and DPR-30, for Quad Cities Nuclear Power Station (QCNPS), Units 1 and 2. The proposed changes will allow QCNPS to use the Unit 1/2 reactor building crane during power operations to lift heavy loads in excess of 110 tons. Specifically, Exelon is requesting approval to revise the QCNPS Updated Final Safety Analysis Report (UFSAR) to allow use of the crane for heavy loads up to a total of 125 tons for removal and re-installation activities for the six reactor cavity shield blocks during the Unit 1 refueling outage, Q1R17. Reactor cavity shield block removal activities are scheduled to commence on November 5, 2002. The total lifting time of these reactor cavity shield blocks for both removal and re-installation activities is estimated to be less than 24 hours.

In 1974, Commonwealth Edison (ComEd) Company, now Exelon, extensively modified the QCNPS and DNPS reactor building cranes with the intent of qualifying the cranes as single failure-proof for the full rated capacity of 125 tons. In support of a Technical Specifications amendment request to support spent fuel cask handling, we provided information regarding these modifications in References 1 and 2. In this information we stated that the fuel casks used would weigh up to 100 tons with a 10 ton lifting rig.

In a teleconference with the NRC on September 13, 2002, the NRC stated that it considers the DNPS reactor building crane approved as meeting single failure-proof criteria only for loads of up to 110 tons. Subsequently, DNPS determined that the reactor cavity shield blocks, which are moved prior to and during the refueling outage, weigh greater than 110 tons. At DNPS, the reactor cavity shield blocks, plus required rigging, weigh less than 116 tons. In Reference 3, DNPS submitted a license amendment request to allow the use of the DNPS Unit 2/3 reactor building crane as single failure-proof for a total load of up to 116 tons to support refueling outage D3R17.

The licensing bases are substantially the same for the DNPS and QCNPS cranes. Thus, it is concluded that the QCNPS reactor building crane is approved as meeting single failure-proof criteria for loads of up 110 tons. At QCNPS the actual weight of the reactor cavity shield blocks is not known with certainty. At DNPS, the actual weights of the top layer (two halves) of the reactor cavity shield blocks are approximately 115 tons and 113 tons. Since the reactor cavity shield blocks at DNPS and QCNPS have similar designs, it is concluded that the weights are also similar. However, as demonstrated at DNPS, variations in the density of reinforced concrete and finish dimensions of the reactor cavity shield blocks can result in a difference in weight between similar components. Based on the expected maximum variation in density and finish dimensions, it is concluded that the weight of the reactor cavity shield blocks at QCNPS, including rigging, is less than 125 tons. Because of this, QCNPS requests approval for lifting a total load of up to 125 tons.

The reactor cavity shield blocks are placed on the refuel floor of the operating unit (i.e., Unit 2). All laydown areas have been optimized to support outage critical path activities and minimize crane moves. This optimization results in improved personnel safety and lower personnel radiation exposures due to less restrictive work areas.

In order to provide a long-term resolution for this issue, Exelon will complete additional analyses and submit a license amendment request related to heavy loads handling to support future refueling outages. In the interim, Exelon is requesting a one-time license amendment to allow use of the QCNPS Unit 1/2 reactor building crane for lifting a total load of up to 125 tons during power operation. This will allow QCNPS to perform required activities, such as reactor disassembly, for refueling outage Q1R17.

B. DESCRIPTION OF THE CURRENT REQUIREMENTS

Regulatory guidance provided in NRC Bulletin 96-02, "Movement of Heavy Loads Over Spent Fuel, Over Fuel in the Reactor Core, or Over Safety-Related Equipment," dated April 1996, provides that movement of heavy loads over spent fuel, fuel in the reactor core, or safety related equipment while the reactor is at power should be conducted in accordance with applicable regulatory requirements and within the guidelines of the current licensing basis. The current QCNPS licensing basis credits the crane as single failure-proof for handling heavy loads. The QCNPS reactor building crane is similar in design to the DNPS reactor building crane which has been approved by the NRC as meeting single failure-proof criteria for handling heavy loads of up to 110 tons. Since the licensing bases are also similar, this limit is also applicable to the QCNPS reactor building crane.

C. BASES FOR THE CURRENT REQUIREMENTS

In NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants," dated July 1980, the NRC provided regulatory guidelines in two phases (Phase I and II) to assure safe handling of heavy loads in areas where a load drop could impact stored spent fuel, fuel in the reactor core, or equipment that may be required to achieve safe shutdown or permit continued decay heat removal. Phase I guidelines address measures for reducing the likelihood of dropping heavy loads and provide criteria for establishing safe load paths, procedures for load handling operations, training of crane operators, design, testing, inspection, and maintenance of cranes and lifting devices. Phase II guidelines address alternatives for mitigating the consequences of heavy load drops, including using either (1) a single failure-proof crane for increased handling system reliability, or (2) electrical interlocks and mechanical stops for restricting crane travel, or (3) load drops and consequence analyses for assessing the impact of dropped loads on plant safety and operations. NUREG-0612, Appendix C provides alternative means of upgrading the reliability of the crane to satisfy the guidelines of NUREG-0554, "Single-Failure-Proof Cranes for Nuclear Power Plants."

Generic Letter (GL) 85-11, "Completion of Phase II of Control of Heavy Loads at Nuclear Power Plants, NUREG-0612," dated June 28, 1985, dismissed the need for licensees to implement the guidelines of NUREG-0612 Phase II based on the improvements obtained from the implementation of NUREG-0612 Phase I. GL 85-11, however, encouraged licensees to implement actions they perceived to be appropriate to provide adequate safety.

In NRC Bulletin 96-02, the NRC staff addressed specific instances of heavy load handling concerns and requested licensees to provide specific information detailing their extent of compliance with the guidelines and their licensing basis guidance and requested responses from licensees regarding heavy loads handling.

The QCNPS response to Bulletin 96-02 determined that the heavy load activities were within the licensing basis. This was based, in part, on our understanding that the QCNPS reactor building crane was single failure-proof for loads of up to 125 tons. This precluded the need to complete load drop analyses or to restrict movement of heavy loads over safety-related equipment while the reactor is at power.

D. NEED FOR REVISION OF THE REQUIREMENTS

In a teleconference with the NRC on September 13, 2002, the NRC stated that it considers the DNPS reactor building crane approved as meeting single failure-proof criteria only for loads of up to 110 tons. Subsequently, DNPS determined that the reactor cavity shield blocks, which are moved prior to and during the refueling outage, weigh greater than 110 tons. At DNPS, the reactor cavity shield blocks, plus required rigging, weigh less than 116 tons. In Reference 3, DNPS submitted a license amendment request to allow the use of the DNPS Unit 2/3 reactor building crane as single failure-proof for a total load of up to 116 tons to support refueling outage D3R17.

The licensing bases are substantially the same for the DNPS and QCNPS cranes. However, as demonstrated at DNPS, there is a potential for variations in the weight of the reactor cavity shield blocks due to variations in concrete density and finished dimensions. Thus, QCNPS requests approval for 125 tons to accommodate variances in weight.

The current QCNPS UFSAR does not consider any credible load drop accidents that result from handling reactor cavity shield blocks with the QCNPS Unit 1/2 reactor building crane over safety-related equipment while the reactor is at power. Thus, since the crane is only approved as single failure-proof for loads of up to 110 tons, the proposed use of the crane for the activities described above could have the potential to create a new accident not analyzed in the UFSAR. Performing these activities without the supporting analyses would require NRC approval in accordance with 10 CFR 50.59, "Changes, tests, and experiments." However, as stated in Attachment C, we have concluded that the proposed changes involve no significant hazards consideration.

QCNPS uses the reactor building crane for heavy loads to support refueling activities. The QCNPS common refuel floor was originally designed to completely disassemble both Unit 1 and Unit 2 reactors simultaneously with all equipment stored within the boundaries of each unit. While this is an option for an emergency shutdown, eventual decommissioning or safe store operations, it is impractical for general refueling operations because of additional laydown space that is required to be utilized. Sharing of common equipment, such as the refuel bridges, decontamination pad and the equipment hatch is required. The amount of equipment and resources that will be needed during the refueling outage will require available floor space on both units. All laydown areas have been optimized to support outage critical path activities and minimize crane moves. This optimization results in improved personnel safety and lower personnel radiation exposures due to less restrictive work areas.

E. DESCRIPTION OF THE PROPOSED CHANGES

Exelon is proposing to revise the QCNPS UFSAR to allow use of the reactor building crane for lifting loads of up to 125 tons to support Q1R17. A marked-up copy of the UFSAR has been provided as Attachment B, detailing these changes. The total lifting time of these reactor cavity shields blocks for both removal and re-installation activities is estimated to be less than 24 hours.

F. SAFETY ANALYSIS OF THE PROPOSED CHANGES

Exelon has concluded that the requested amendment is acceptable for the following reasons.

- The reactor building crane was modified with the intent of qualifying it as single failure-proof for 125 tons. The reactor building crane has additional capacity for a total lifted load of 125 tons with single failure-proof features if a Design Basis Earthquake (DBE) is not assumed.
- The probability of a DBE during the limited duration of the request is very small.
- The results of a DNPS load drop analysis will be used to provide additional assurance that no adverse consequences will result from a postulated load drop.

Reactor building crane capacity

The stresses experienced by the QCNPS reactor building crane were analyzed for the bridge, the trolley, and all of the major components listed in Attachment 1 of Reference 2. The various components have been designed with significant margin to the yield and ultimate strength of the material.

However, the licensing basis for this crane limits its load to 110 tons as a single failure-proof crane. The loads applied to the crane structure were increased by 15% (vertical) and 88% (lateral) to account for the DBE load case. Removal of the DBE loads will result in a minimum increase of 15% in the load carrying capacity of the crane structure using the same allowables. This additional increase is more than sufficient to offset the lifted load increase of the crane to 125 tons.

References 1 and 2 identify substantial factors of safety for the 125 ton reactor building crane single element components within the crane hoisting system load path and components critical to crane operations. Hence, margin exists in the load carrying capacity of these components.

The other features of the crane recognized by the NRC in approving the QCNPS reactor building crane as single failure-proof are unaffected by this request. The crane hoist system consists of a dual load path through the hoist gear train, the reeving system, and the hoist load block along with restraints at critical points to provide load retention and minimization of uncontrolled motions of the load in the event of failure of any single hoist component. Redundancy has been designed into the hoist and trolley brakes and the crane control components.

Probability of a Design Basis Earthquake
Based on seismic estimates for the QCNPS site that the NRC has published in NUREG-1488, "Revised Livermore Seismic Hazard Estimates for Sixty-Nine Nuclear Power Plant Sites East of the Rocky Mountains, 1994," the frequency of equaling or exceeding the QCNPS DBE level is very low. Furthermore, as discussed above, the cumulative period of time required for the load lifts of concern is short (i.e., 24 hours). Therefore, the probability is very low that a DBE would occur during one of the load lifts.

Load drop analysis
As discussed in Reference 3, DNPS is completing a load drop analysis to ensure that the consequences of a load drop are acceptable for the proposed DNPS amendment. QCNPS will impose restrictions on the movement of the reactor cavity shield blocks consistent with those determined for DNPS, considering any relevant differences in the analysis assumptions.

G. IMPACT ON PREVIOUS SUBMITTALS

Exelon has reviewed the proposed change and has determined that there is no impact on any previous license amendment request submittals awaiting NRC approval.

H. SCHEDULE REQUIREMENTS

Exelon is requesting approval of this amendment by November 4, 2002, on an exigent basis in accordance with 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (a)(6). This request meets the criteria of 10 CFR 50.91 (a)(6) because time does not permit the NRC to publish a Federal Register notice allowing 30 days for prior public comment and the requested amendment involves no significant hazards consideration. In accordance with 10 CFR 50.91 (a)(6)(vi), the exigency could not be avoided by Exelon for the following reasons.

- As noted above, on September 13, 2002, the NRC informed Exelon that the DNPS crane was approved as meeting single failure-proof criteria for loads of up to 110 tons. In response, DNPS considered options to allow the DNPS crane to be used for reactor disassembly for the Unit 3 refueling outage heavy loads activities. These options included determining the weight of the reactor shield blocks.
- On September 20, 2002, DNPS determined that the weight of the reactor cavity shield blocks is greater than 110 tons.
- In a teleconference on September 25, 2002, between members of Exelon and members of the NRC, the NRC indicated that a license amendment would be required to allow DNPS to lift the reactor cavity shield blocks over an operating unit.
- In response, Exelon submitted a license amendment request for DNPS on September 26, 2002. This amendment request was submitted for DNPS only, due to the extremely limited time available prior to scheduled heavy loads activities at DNPS, which were scheduled to begin on October 6, 2002.
- Immediately following submittal of the license amendment request for DNPS, Exelon began reviewing options to allow the QCNPS reactor building crane to be used for reactor disassembly for the Unit 1 refueling outage heavy loads activities. This review

considered the possibility of placing the reactor shield blocks on the refueling floor of the shutdown unit. On September 27, 2002, it was determined that a license amendment request would be required for QCNPS.

- The enclosed license amendment request has been submitted in a timely manner based on the developments described above. Exelon could not have avoided the exigency due to the rapidly developing nature of this situation and its applicability to both DNPS and QCNPS.

I. REFERENCES

1. Letter from J. S. Abel (Commonwealth Edison Company) to U. S. NRC, "Dresden Station Units 2 and 3, Quad Cities Station Units 1 and 2, Dresden Special Report No. 41, Quad Cities Special Report No. 16, 'Reactor Building Crane and Cask Yoke Assembly Modifications,' AEC Dckt. 50-237, 50-249, 50-254 and 50-265," dated November 8, 1974

2. Letter from J. S. Abel (Commonwealth Edison Company) to U. S. NRC, "Dresden Station Units 2 and 3, Quad Cities Station Units 1 and 2, Dresden Special Report No. 41, Supplement A, Quad Cities Special Report No. 16 – Supplement A, 'Reactor Building Crane and Cask Yoke Assembly Modifications,' NRC Dckts. 50-237, 50-249, 50-254 and 50-265," dated June 3, 1975

3. Letter from K. R. Jury (Exelon Generation Company) to U. S. NRC, "Request for License Amendment Related to Heavy Loads Handling," dated September 26, 2002

Attachment B

Proposed Revisions to the Updated Final Safety Analysis Report

9.1-63 Positive indication of closure of the grapple hook is provided to reduce the probability that an improperly loaded bundle will be lifted and possibly dropped.

9.1-64 An additional electrical interlock prevents raising the main hoist while the hoist is loaded unless the grapple is fully closed and in the engaged position.

9.1-65 To prevent accidental damage to fuel or fuel handling equipment, a slack cable interlock prevents lowering the refueling platform main hoist with less than a nominal load on the cable. Should the hoist jam, further upward-motion is blocked by a load cell force switch which operates at the maximum permissible load.

9.1.4.3.2 Reactor Building Overhead Crane insert attached A

9.1-66 The reactor building crane is ~~single-failure proof~~. Within the dual load path, the design criteria are such that all dual elements comply with the CMAA Specification No. 70 for allowable stresses, except for the hoisting rope which is governed by more stringent job specification criteria. All single element components, within the load path, have been designed to a minimum safety factor of 7.5 based on the ultimate strength of the material. Table 9.1-3 lists the results of the component failure analysis.

All analyses performed relative to the overhead crane handling system loads have been based on the National Lead 10/24 spent fuel shipping cask which weighs 100 tons (Figure 9.1-17). If larger casks are used, additional analyses will be required to assure safety margins are maintained.

Administrative controls and installed limit switches restrict the path of travel of the crane and fuel cask to a specific controlled area. The controls are intended to assure that a controlled path is followed in moving a cask between the shipping area and the spent fuel pool.

9.1-67 Station procedures prohibit movement of heavy loads over the spent fuel storage pools or open reactor cavity except under special procedures that have been reviewed and approved by an on-site designated committee.

9.1-67a In addition, procedural controls have been established which suspend crane operations under the following conditions.

- When irradiated fuel assemblies are in the spent fuel storage pool, the storage pool level must be maintained within the Technical Specification limit or crane operations with loads in the spent fuel storage pool area will be suspended after placing the crane load in a safe condition.

- When a unit is in MODES 4, 5 or when handling irradiated fuel in the secondary containment, the Technical Specification AC Source requirements must be met or crane operation over the spent fuel storage will be suspended if fuel assemblies are stored in the pool.

9.1-68 The crane reeving system does not meet the recommended criteria of Branch Technical Position APCSB 9-1, for wire rope safety factors and fleet angles. The purpose of these criteria is to assure a design which minimizes wire rope stress wear and thereby provides maximum assurance of crane safety under all operating and maintenance conditions.

Insert A

designated as a single failure proof crane for 110-ton loads. The NRC has approved use of the reactor building overhead crane during power operations to lift a total load up to 125 tons for removal and installation activities for the reactor shield blocks prior to and during Unit 1 refueling outage Q1R17.

"Two blocking" is an inadvertently continued hoist which brings the load and head block assemblies into physical contact, thereby preventing further movement of the load block and creating shock loads to the rope and reeving system. To provide adequate protection against "two blocking" in the event of a fused contactor in the main hoist control circuitry, a mechanically-operated power limit switch in the main hoist motor power circuit on the load side of all hoist motor power circuit controls is provided. This power limit switch will interrupt power to the main hoist motor and cause the holding brakes to set prior to "two blocking."

9.1-69 The reactor building refueling floor has been designed for a live load of 1000 psf. The entire reactor building refueling floor (with the exception of the fuel pool and open reactor cavity) is considered a safe load path zone. Procedures prohibit handling or movement of heavy loads over spent fuel in the fuel pools or over the open reactor cavity unless a specific procedure has been written and approved.

A 9-ton load drop has been analyzed and the results show that the refueling floor can survive a drop from 7 feet without scabbing damage. Procedures limit the 9-ton lift height to a maximum of 7 feet. Existing procedural controls limit both the height of a lift to clear obstacles and require the use of the most direct path to laydown areas.

Insert attached B

The reactor building main crane meets the single-failure criteria stated in NUREG-0612. As required by CMAA-70, the maximum crane load weight plus the weight of the bottom block, divided by the number of parts of rope does not exceed 20% of the manufacturer's published breaking strength.

The reactor building crane main hook has:

A rated load capacity = 250,000 lbs
Block and rope weight = 20,500 lbs
Total weight lifted = 270,500 lbs

This is supported by 12 parts of wire rope with a published breaking strength of 175,800 pounds.

$$\frac{\text{Total weight lifted/Number of parts rope}}{\text{Breaking strength of rope}} = \frac{270,500}{12 \times 175,800} = 12.8\% \qquad (9.1\text{-}1)$$

which is less than the 20% CMAA-70 requirement.

9.1-70 A detailed analysis of the possibility of horizontal displacement of the cask in the event one of the redundant rope trains fails has been conducted. It has been confirmed that the horizontal load displacement will not exceed 2 1/2 inches throughout the critical elevations of lift. At the high point of the lift, with the cask above the operating floor, the static displacement of the load is approximately 1/2-inch with a total static plus dynamic displacement of approximately 1 inch. The total horizontal displacement of the load when the cask is submerged in the fuel pool is approximately 2 1/2 inches. A larger total horizontal displacement, approximately 9 inches, can occur with the load at its lowest elevation, that is with the load at the grade elevations. However, it must be remembered that the 100-ton cask, which is the heaviest load to be lifted through the equipment hatchway, is 7 feet 4 inches in diameter and 7 feet 10 inches across the cask yoke. The equipment hatchway has a minimum 20-foot 1-inch square opening. (Figure 9.1-18) Local protrusions of ductwork along the vertical path of the cask through the hatchway reduce

Insert B

The reactor building overhead crane meets the single-failure criteria stated in NUREG-0612 for heavy loads of 110 tons. The NRC has approved use of the reactor building overhead crane during power operations to lift a total load up to 125 tons for removal and installation activities for the reactor shield blocks prior to and during Unit 1 refueling outage Q1R17.

Attachment C

INFORMATION SUPPORTING A FINDING OF NO SIGNIFICANT HAZARDS CONSIDERATION

According to 10 CFR 50.92, "Issuance of amendment," paragraph (c) a proposed amendment to an operating license involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not:

(1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or

(2) Create the possibility of a new or different kind of accident from any accident previously evaluated; or

(3) Involve a significant reduction in a margin of safety.

In support of this determination, an evaluation of each of the three criteria set forth in 10 CFR 50.92 is provided below regarding the proposed license amendment.

Overview

In accordance with 10 CFR 50.90, "Application for amendment of license or construction permit," Exelon Generation Company (Exelon), LLC, is requesting changes to Facility Operating License Nos. DPR-29 and DPR-30, for Quad Cities Nuclear Power Station (QCNPS), Units 1 and 2. Specifically, the proposed changes will allow Exelon to revise the QCNPS Updated Final Safety Analysis Report (UFSAR) to allow use of the reactor building crane at QCNPS during power operations to lift heavy loads up to a total of 125 tons for removal and re-installation activities for six reactor cavity shield blocks during the Unit 1 refueling outage. Reactor cavity shield block removal activities are scheduled to commence on November 5, 2002.

The proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed changes will allow use of the reactor building crane at Quad Cities Nuclear Power Station (QCNPS) during power operations to lift heavy loads up to 125 tons for removal and re-installation activities for the reactor cavity shield blocks during the Unit 1 refueling outage (i.e., Q1R17). The reactor building crane has additional margin for a total lifted load of 125 tons with single failure-proof features if a Design Basis Earthquake (DBE) is not assumed. Exelon has qualitatively demonstrated that the probability of a DBE occurring during the limited duration (estimated to be 24 hours) of the request is very small. The probability of load drop accidents previously evaluated is not increased since the capacity of the reactor building crane equals or exceeds the weight of the reactor cavity shield blocks.

Therefore, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

Attachment C

INFORMATION SUPPORTING A FINDING OF NO SIGNIFICANT HAZARDS CONSIDERATION

The proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed changes allow use of the QCNPS reactor building crane for a limited duration to lift heavy loads up to a total of 125 tons during removal and re-installation activities for the reactor cavity shield blocks. The reactor building crane has additional margin for a lifted load of 125 tons with single failure-proof features if a DBE is not assumed. The probability of a DBE during the limited duration of the request is very small. Therefore, the single failure-proof features ensure that the proposed changes provide an equivalent level of safety and will not create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed changes do not involve a significant reduction in a margin of safety.

The reactor building crane is rated for lifting loads up to 125 tons. The NRC has approved qualification of the QCNPS reactor building crane as single failure-proof for loads of up to 110 tons. The proposed change allows use of the crane for a limited duration to lift loads up to 125 tons. Existing safety margins are enhanced when lifting loads up to 125 tons if a DBE is not assumed, and Exelon has demonstrated that the probability of a DBE during the limited duration of the request is very small. Therefore, it is concluded that the proposed changes do not result in a significant reduction in the margin of safety.

Conclusion

Based upon the above evaluation, Exelon has concluded that the criteria of 10 CFR 50.92(c) are satisfied and that the proposed UFSAR changes involve no significant hazards consideration.

Attachment D

INFORMATION SUPPORTING AN ENVIRONMENTAL ASSESSMENT

In accordance with 10 CFR 50.90, "Application for amendment of license or construction permit," Exelon Generation Company (Exelon), LLC, is requesting changes to Facility Operating License Nos. DPR-29 and DPR-30 for Quad Cities Nuclear Power Station (QCNPS), Units 1 and 2. Specifically, the proposed changes will allow Exelon to revise the QCNPS Updated Final Safety Analysis Report (UFSAR) to allow use of the QCNPS Unit 1/2 reactor building crane for a limited duration to lift heavy loads up to a total of 125 tons during removal and re-installation activities for the reactor cavity shield blocks.

Exelon has evaluated these proposed changes against the criteria for identification of licensing and regulatory actions requiring environmental assessment in accordance with 10 CFR 51.21, "Criteria for and identification of licensing and regulatory actions requiring environmental assessments." Exelon has determined that these proposed changes meet the criteria for a categorical exclusion set forth in 10 CFR 51.22, "Criterion for categorical exclusion; identification of licensing and regulatory actions eligible for categorical exclusion or otherwise not requiring environmental review," paragraph (c)(9), and as such, has determined that no irreversible consequences exist in accordance with 10 CFR 50.92, "Issuance of amendment," paragraph (b). This determination is based on the fact that these changes are being proposed as an amendment to a license issued pursuant to 10 CFR 50, "Domestic Licensing of Production and Utilization Facilities," which changes a requirement with respect to installation or use of a facility component located within the restricted area, and the amendment meets the following specific criteria:

(i) The proposed changes involve no significant hazards consideration.

As demonstrated in Attachment C, the proposed changes do not involve a significant hazards consideration.

(ii) There is no significant change in the types or significant increase in the amounts of any effluent that may be released offsite.

The proposed changes allow use of the QCNPS reactor building crane for a limited duration to lift heavy loads up to 125 tons during removal and re-installation activities for the reactor cavity shield blocks. There will be no significant increase in the amounts of any effluents released offsite. The proposed changes do not result in an increase in power level, do not increase the production, nor alter the flow path or method of disposal of radioactive waste or byproducts. Therefore, the proposed changes will not affect the types or increase the amounts of any effluents released offsite.

(iii) There is no significant increase in individual or cumulative occupational radiation exposure.

The proposed changes will not result in changes in the configuration of the facility. There will be no change in the level of controls or methodology used for processing of radioactive effluents or handling of solid radioactive waste, nor will the proposal result in any change in the normal radiation levels within the plant. Therefore, there will be no increase in individual or cumulative occupational radiation exposure resulting from these changes.